

Claims

1. Method for the uncoverage and the local enclosure of unwanted radio transmissions (5, 12, 19), for example unwanted telephony with mobile radiotelephones, in which with at least one radio receiver (2) with an antenna, which can be influenced in respect of their receiving properties, a surrounding area of the radio receiver (2) is examined for the existence of radio transmissions (5, 12, 19),
- 5 characterized in that
- after at least one initial training phase, in which by means of changing locally allocation between a reference emitting device for radio transmissions (5, 12, 19) and the radio receiver (2) representations of emitted and locally known reference radio
- 10 transmissions are recorded,
- at least a first measurement phase is carried out, during which the surrounding area is scanned by the radio receiver (2) for the existence of radio transmissions (5, 12, 19) of unwanted emitting devices (6, 13, 17) and by recognition of unwanted radio
- 15 transmissions (5, 12, 19) a representation of the unwanted radio transmission (5, 12, 19) is determined,
- during existence of unwanted radio transmissions (5, 12, 19) an evaluation phase follows, in which the representations recorded during initial training phase and the representation of the recorded radio transmissions (5, 12, 19) are compared with
- 20 each other and there from an information about the local position of the emitting device (6, 13, 17) of the unwanted radio transmissions (5, 12, 19) in the surrounding area is evaluated.
2. Method as claimed in claim 1, **characterized in that** a first measuring phase is carried out, during which the radio receiver (2) scans the surrounding area fast and with less
- 25 accuracy for the existence of unwanted radio transmissions (5, 12, 19).
3. Method as claimed in one of the claims 1 or 2, **characterized in that** the surrounding area is scanned totally or partially by the radio receiver (2) for unwanted radio transmissions (5, 12, 19).
4. Method as claimed in claim 1, **characterized in that** after the recognition of an unwanted radio transmission (5, 12, 19) a second measuring phase is carried out, during
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which the registered unwanted radio transmission (5, 12, 19) is measured with more accuracy.

5. Method as claimed in claim 4, **characterized in that** the recognized unwanted radio transmission (5, 12, 19) is measured with higher resolution of the radio receiver (2).
- 5 6. Method as claimed in claim 5, **characterized in that** the recognized unwanted radio transmission (5, 12, 19) is measured with higher resolution by a change of the directive efficiency of the radio receiver (2).
7. Method as claimed in one of the above mentioned claims, **characterized in that** the measurement signals of the secondary measurement phase at registering an unwanted
10 radio transmission (5, 12, 19) phase are transmitted to a evaluation device, in which the measurement signals are evaluated in form of a one-dimensional or two-dimensional representation of the radio transmission (5, 12, 19).
8. Method as claimed in claim 7, **characterized in that** the representation of the radio transmission (5, 12, 19) is compared for correspondences with the representations re-
15 corded in the initial training phase.
9. Method as claimed in one of the claims 7 or 8, **characterized in that** the comparison of the representation recorded in the initial training phase and the representation of the radio transmission (5, 12, 19) is carried out by means of methods of pattern recognition and/or image analysis.
- 20 10. Method as claimed in one of the claims 7 to 9, **characterized in that** as methods of pattern recognition and/or image analysis fuzzy techniques are employed.
11. Method as claimed in one of the claims 7 to 10, **characterized in that** the representation recorded in the initial training phase, which comes closest to the representation of the radio transmission (5, 12, 19), as well as the local position of the reference radio
25 transmission known by the initial training phase are used as information for the local position of the emitting device (6, 13, 17) of the unwanted radio transmission (5, 12, 19) in the surrounding area.
12. Method as claimed in claim 11, **characterized in that** in case of evaluation of the local position of the emitting device (6, 13, 17) of a unwanted radio transmission (5, 12,
30 19) in a part of the surrounding area, in which radio transmission are unwanted, the evaluation device automatically alarms the operating personnel.

13. Method as claimed in claim 11, **characterized in that** in case of evaluation of the local position of the emitting device (6, 13, 17) of a unwanted radio transmission (5, 12, 19) in a part of the surrounding area, in which radio transmission are tolerated, the alarm for the operating personnel is suppressed.
- 5 14. Method as claimed in one of the claims 7 to 13, **characterized in that** the closest representation recorded during the initial training phase and the representation of the unwanted radio transmission (5, 12, 19) are examined for the degree of correspondence by means of different features.
- 10 15. Method as claimed in one of the claims 7 to 13, **characterized in that** additional information coming from the unwanted radio transmission (5, 12, 19), preferably signal run-times, time offset while channel switching or the like, are used as further information during evaluation of the signals of the radio receiver (2) in the evaluation device.
- 15 16. Method as claimed in one of the above mentioned claims, **characterized in that** the signals of more than one radio receiver (2) are evaluated in the evaluation device and are connected to a common representation of the radio transmission (5, 12, 19).
- 20 17. Method as claimed in one of the above mentioned claims, **characterized in that** for common radiotelephony devices, so-called cellular phones, for the evaluation of the representation also the radio transmissions (5, 12, 19) of such radiotelephony devices in the so-called stand-by mode are used for determining the local position of the radiotelephony device.
- 25 18. Method as claimed in claim 17, **characterized in that** for determining the local position of such radiotelephony devices in the so-called stand-by mode the radio transmissions (5, 12, 19) of the clock-pulse controlled switching online or offline the receivers of the radiotelephony devices is used.
- 30 19. Method as claimed in one of the above mentioned claims, **characterized in that** the method also serves for determining the local position of unspecific radio transmissions (5, 12, 19) of common electrotechnical devices, preferably so-called notebooks, CD-players or the same, which set free noise fields of a high frequency kind.
20. Method as claimed in one of the above mentioned claims, **characterized in that** at recognising multiple simultaneous radio transmissions (5, 12, 19) of different unwanted

emitting device (6, 13, 17) a special treatment of the measurement signals of the radio receiver (2) is carried out, in which the signals are treated separately.

21. Method as claimed in one of the above mentioned claims, **characterized in that** the radio receiver (2) and/or the reference emitting device are moved on a respective to their position known path during the initial training phase and the radio receiver (2) records at known spots of this path reference radio transmissions.
22. Method as claimed in one of the above mentioned claims, **characterized in that** the initial training phase is carried out unique or after longer time intervals und the so developing representations of typical radio transmissions (5, 12, 19) are stored.
23. Method as claimed in claim 22, **characterized in that** the initial training phase is carried out each time, when the conditions of the surrounding area of the radio receiver (2) have changed significantly, preferably have changed seasonal.
24. Device for the uncoverage and the local enclosure of unwanted radio transmissions (5, 12, 19), for example unwanted telephony with mobile radiotelephones, especially for implementation of the method according to claim 1, showing at least one radio receiver (2) with a receiving device, which can be influenced in respect of their receiving properties,
characterized in that
the receiving device shows a directional antenna.
25. Device as claimed in claim 24, **characterized in that** the radio receiver (2) is influ-
encable in his directive efficiency and/ or his resolution.
26. Device as claimed in one of the claims 24 or 25, **characterized in that** the directive efficiency of the receiving device is controllable about at least a part of the total ball surface surrounding the receiving device.
27. Device as claimed in one of the claims 24 to 26, **characterized in that** the change of the directive efficiency of the receiving device is caused mechanically or electrically.
28. Device as claimed in one of the claims 24 to 27, **characterized in that** the change of the directive efficiency is influencable by a swivel of the receiving lobe or of the receiving minimum or by a method of radiogoniometrical techniques.

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